

Chandra Calibration Status



IACHEC Meeting March 26, 2012

Newly Released Calibration Products

ACIS

- Quarterly ACIS-I and ACIS-S gain corrections.

HRC

- Yearly HRC-I and HRC-S gain corrections.
- A set (one per year) of time-dependent HRC-S QE maps. These maps apply a grey correction of 0.5% per year decline in the QE along the dispersion direction and a 0.8% per year decline at the location of the 0th order.

Detector	Gain Updates	QE updates at present	QE updates near future
ACIS-S	Quarterly	None	Yearly(?)
ACIS-I	Quarterly	None	Yearly(?)
HRC-I	Yearly	None	None
HRC-S	Yearly	Yearly	Yearly

Recent Calibration Products or Software Releases

HETG

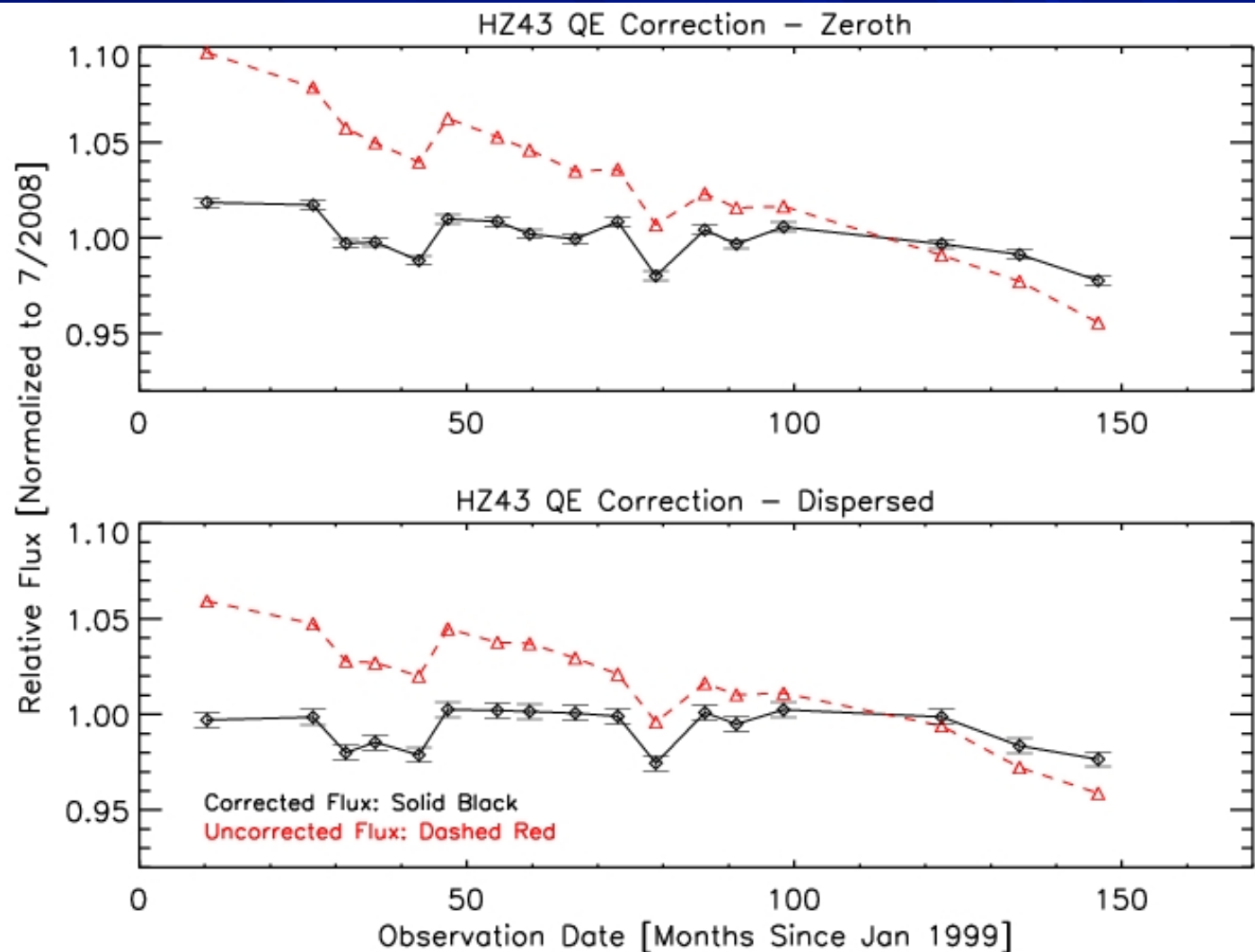
- Released updated versions of the HEG and MEG first order transmission efficiencies.

LETG

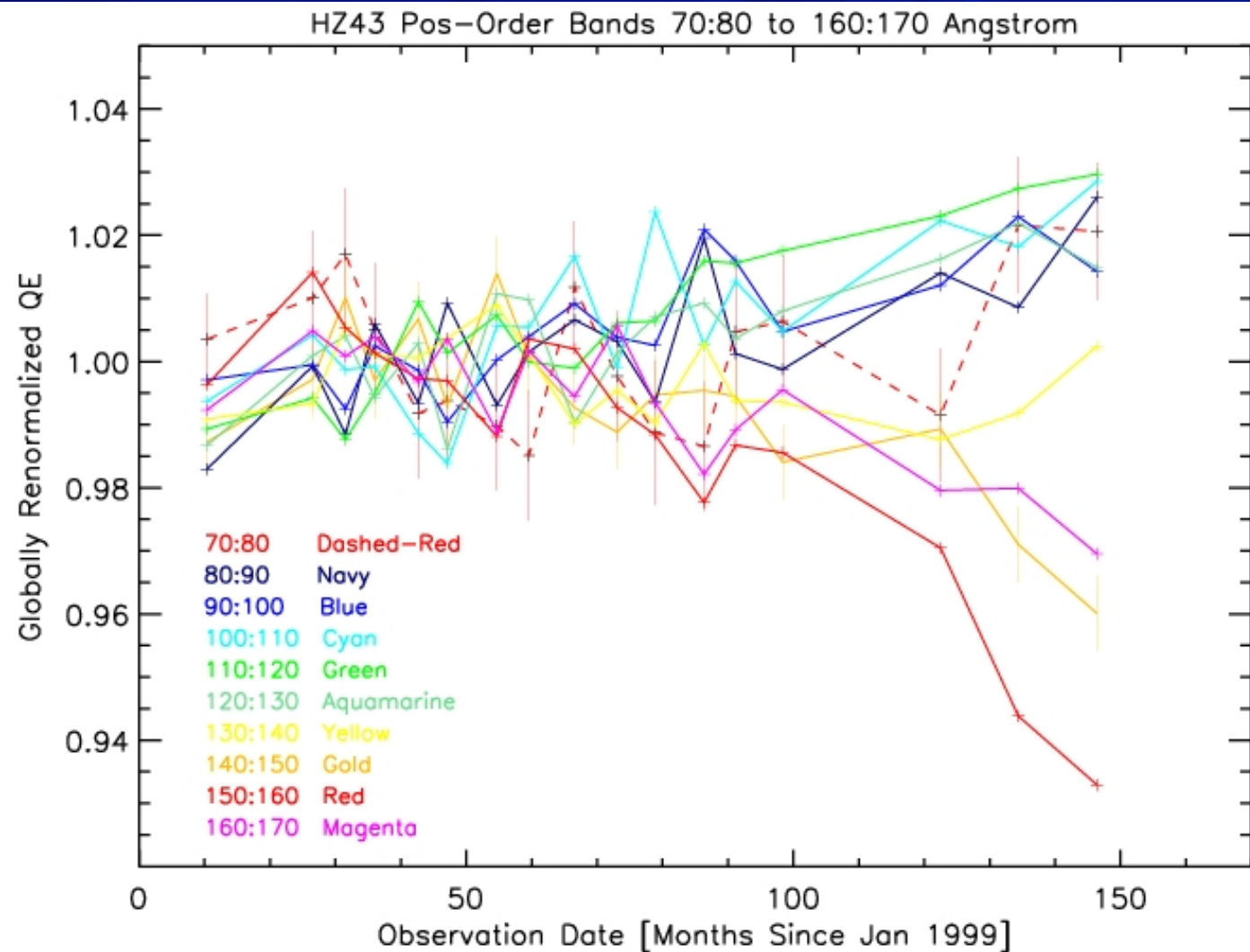
- Released updated higher order ($m=2-10$) transmission efficiencies.

QE Calibration – HRC-S

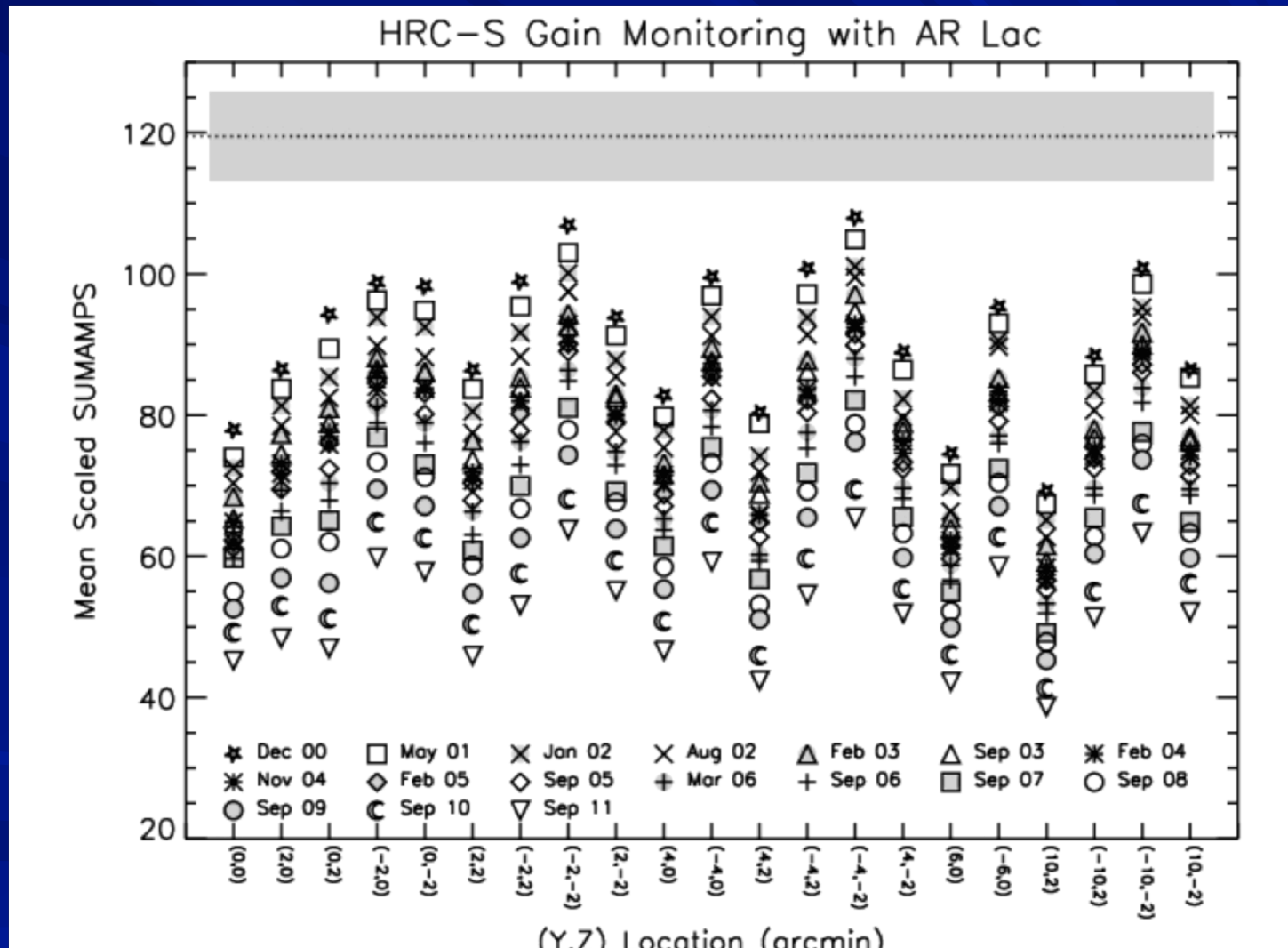
Result of present grey correction – broad band flux



HRC-S wavelength-dependent QE loss

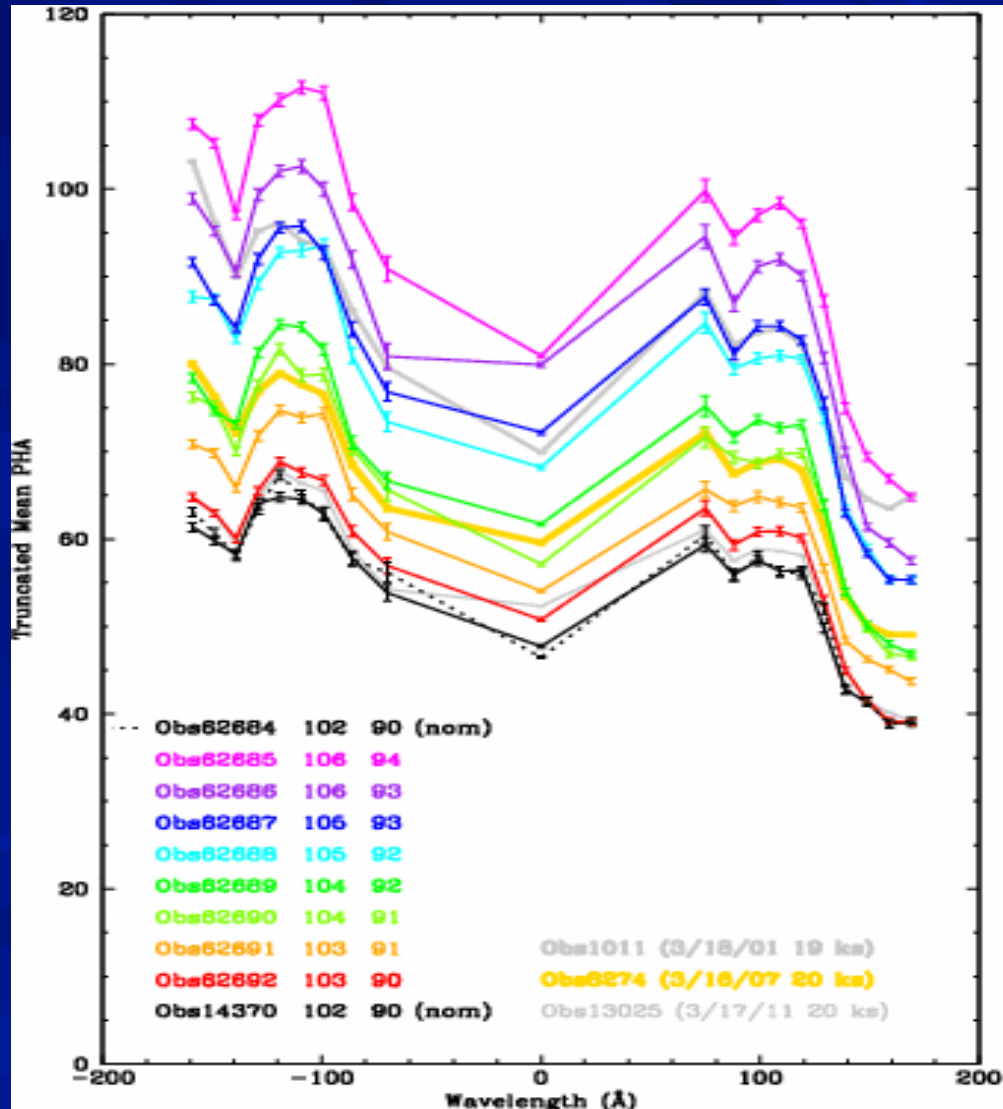


HRC-S Gain throughout the Chandra mission

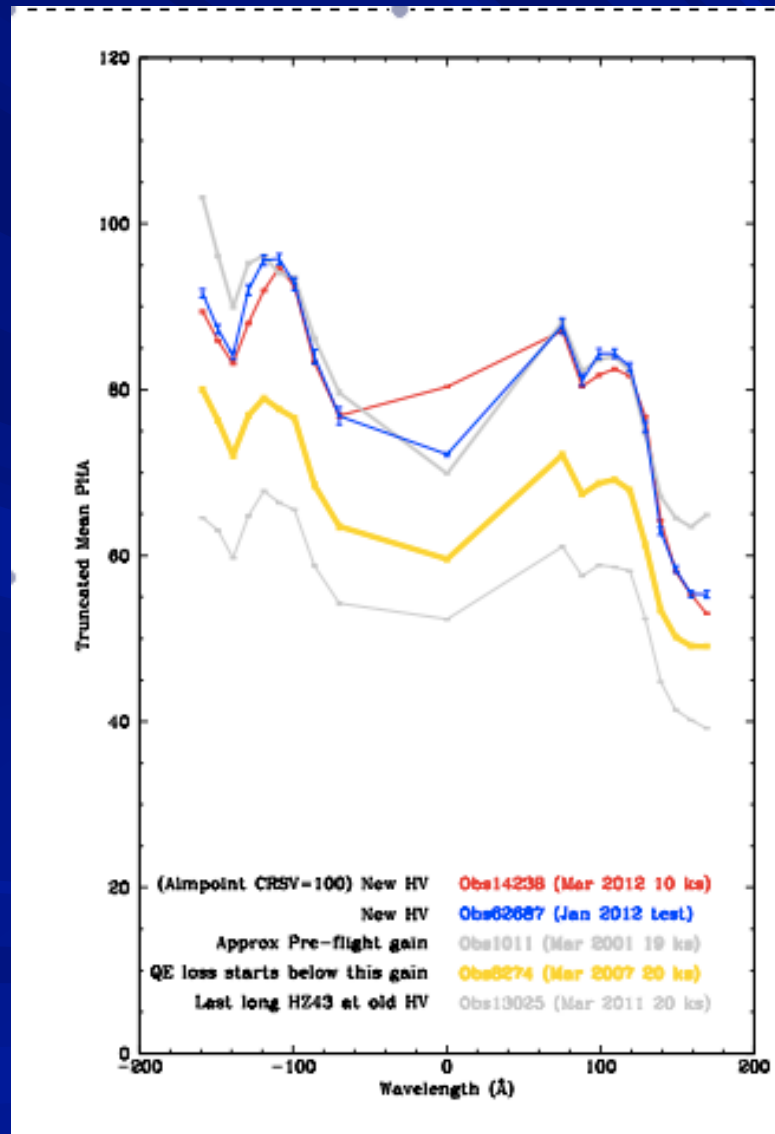


HRC-S High Voltage Test - Jan. 2012

LETG/HRC-S observations of HZ43

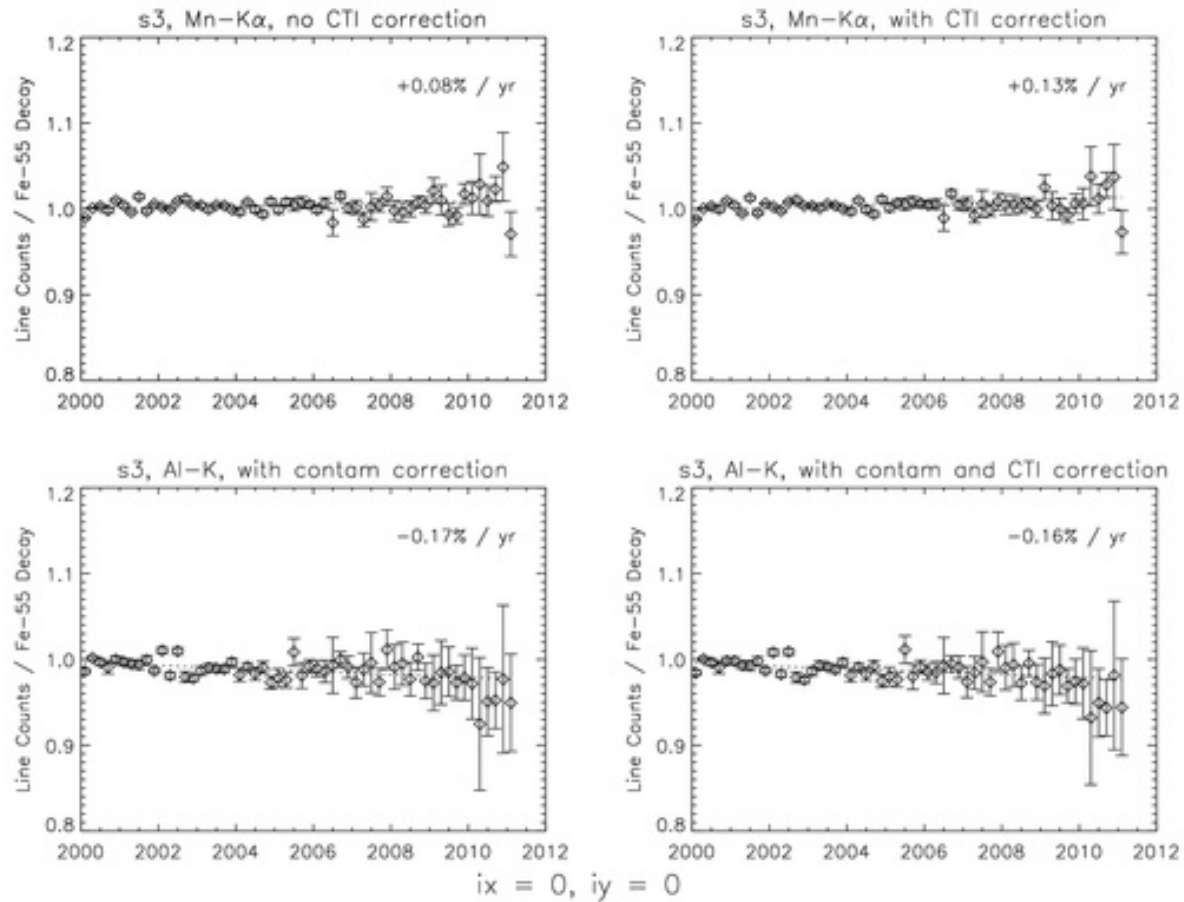


March 2012 LETG/HRC-S observation of HZ43 with new HV setting



QE Calibration – ACIS-S3

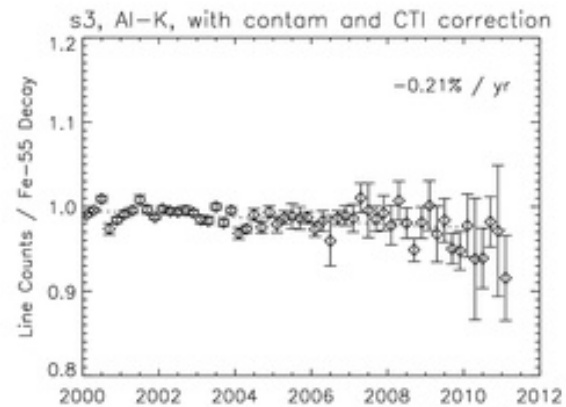
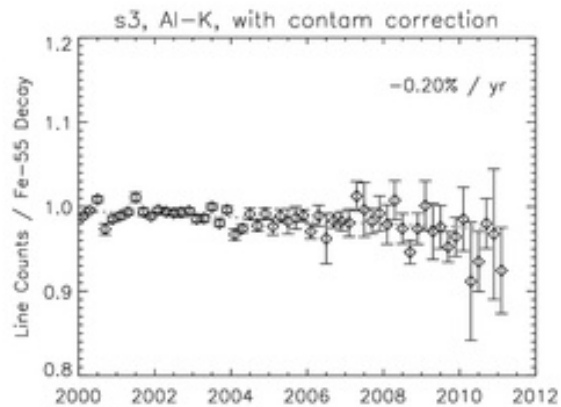
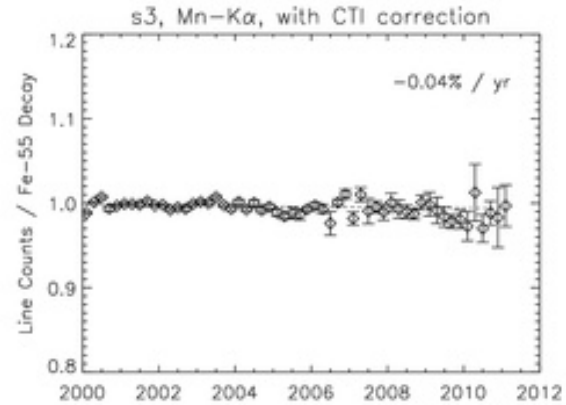
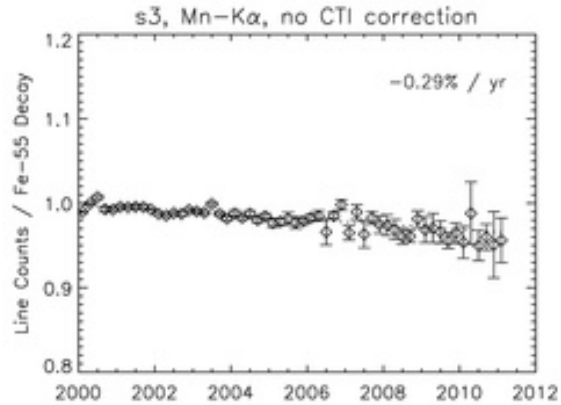
ECS Data



Near read out

QE Calibration – ACIS-S3

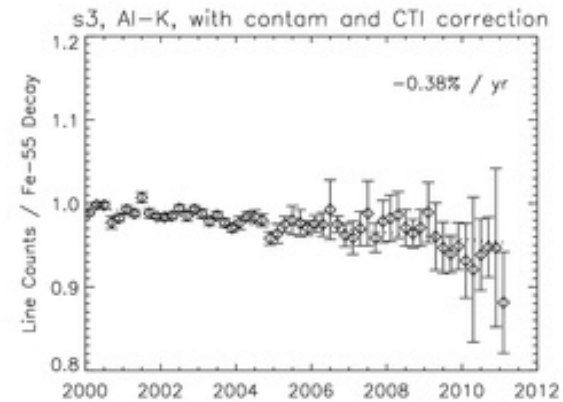
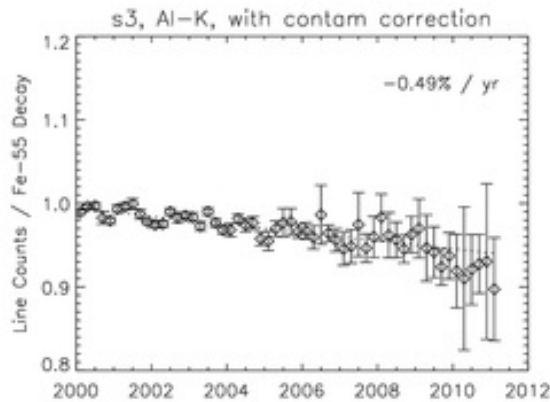
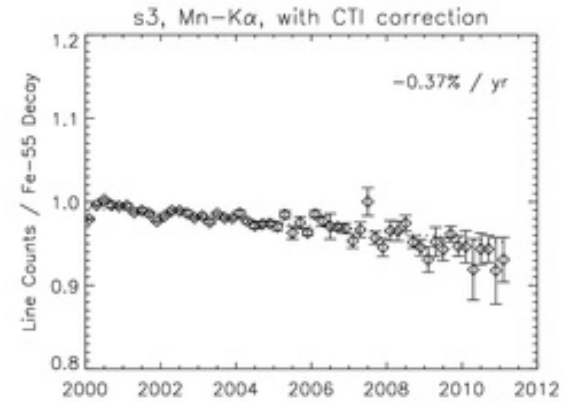
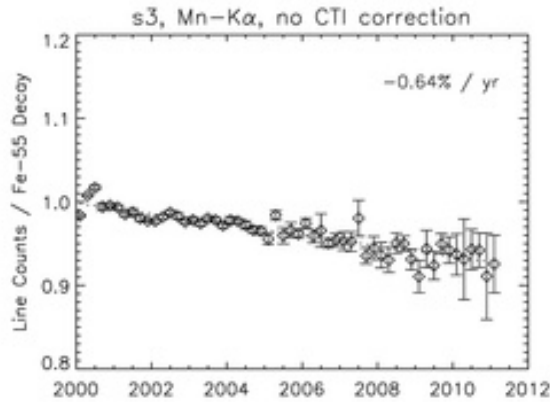
ECS Data



ix = 0, iy = 3
Middle of chip

QE Calibration – ACIS-S3

ECS Data

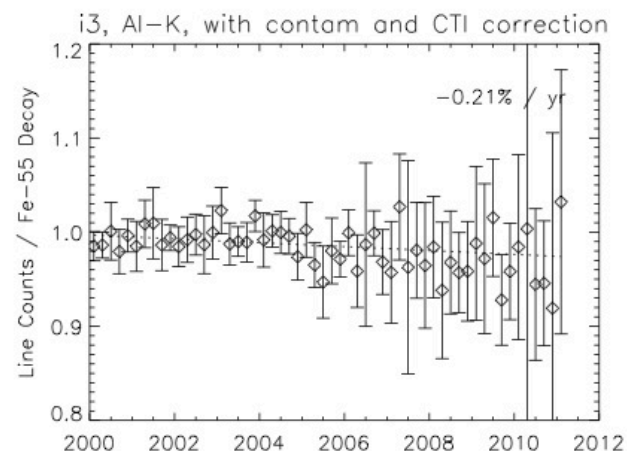
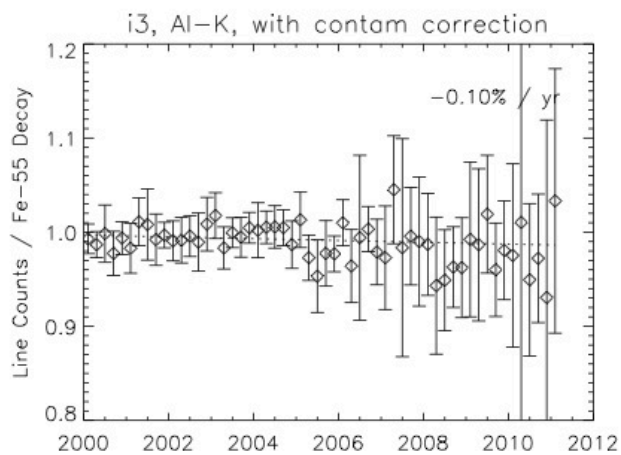
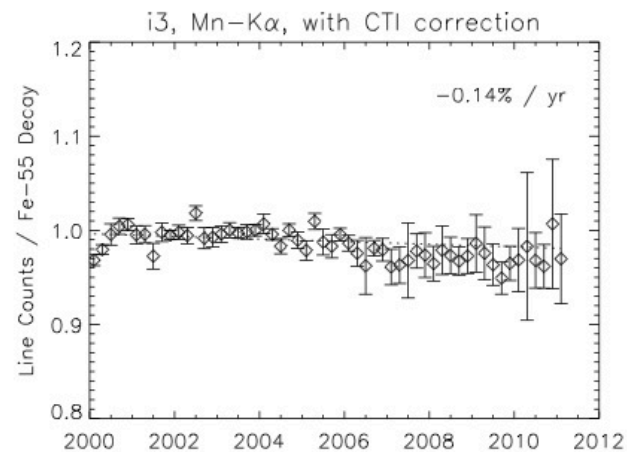
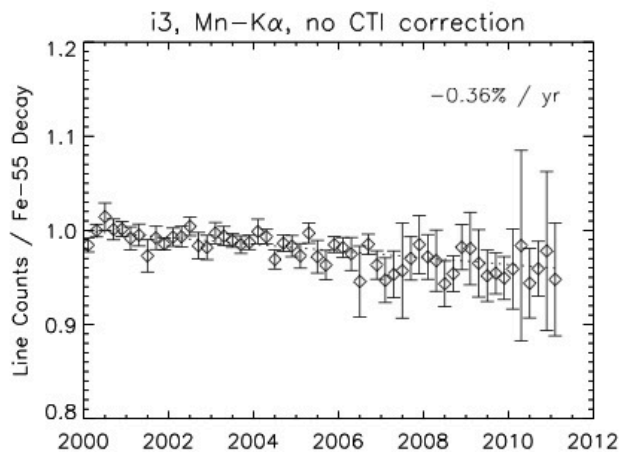


ix = 0, iy = 7

Top of chip

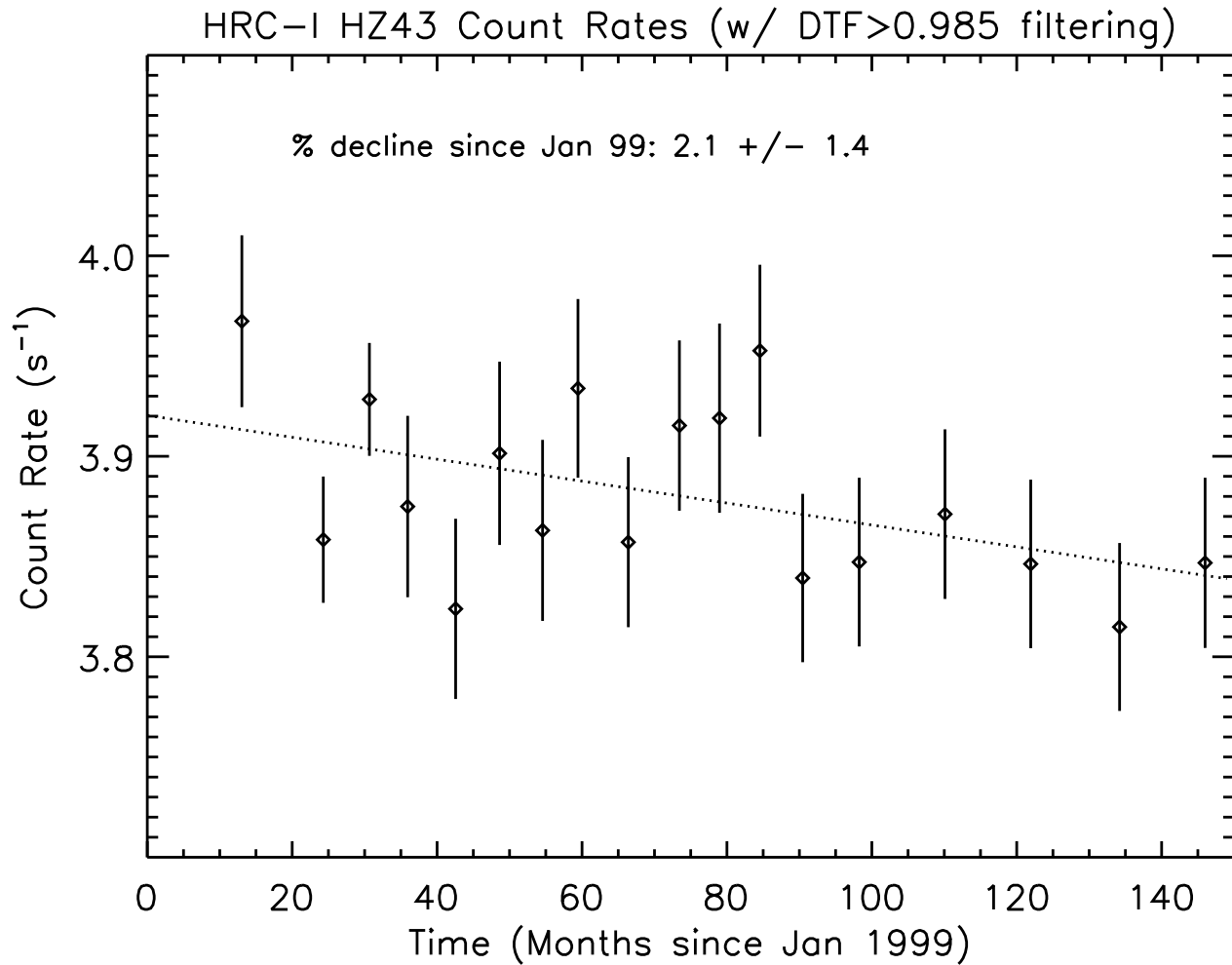
QE Calibration – ACIS-I3

ECS



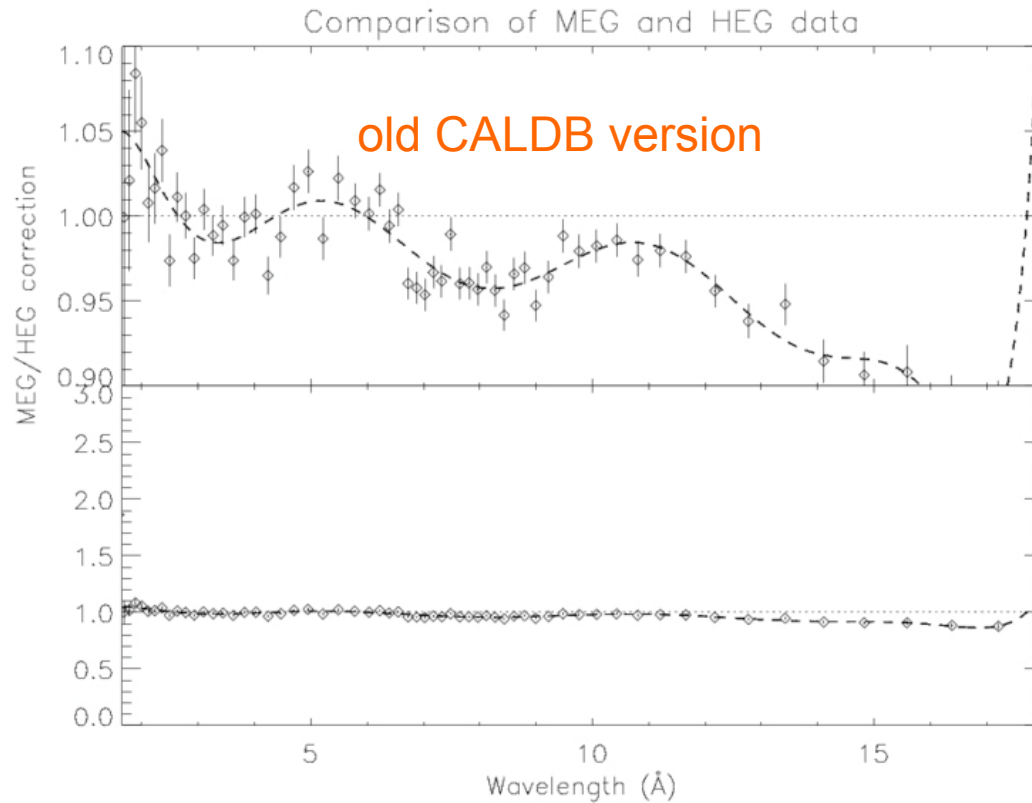
ix = 3, iy = 3

QE Calibration – HRC-I



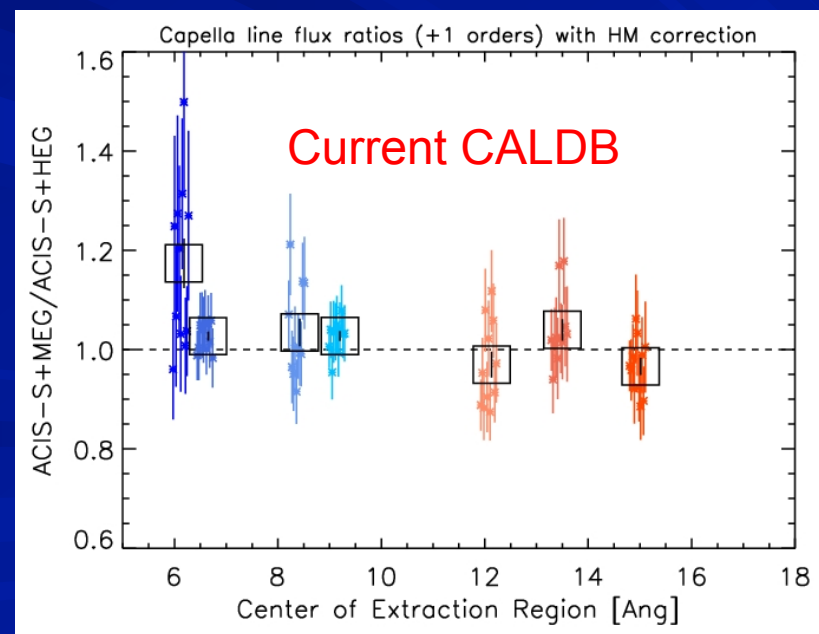
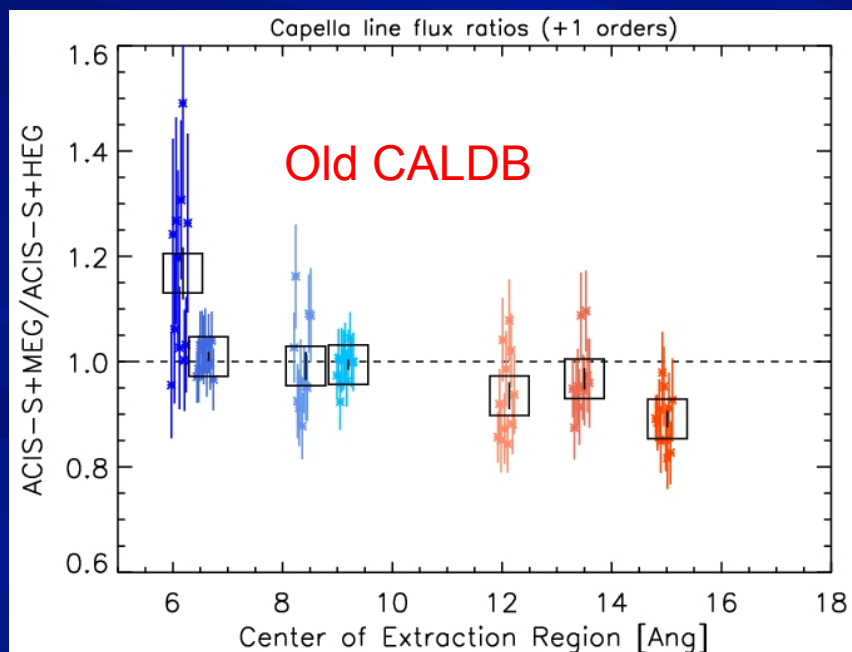
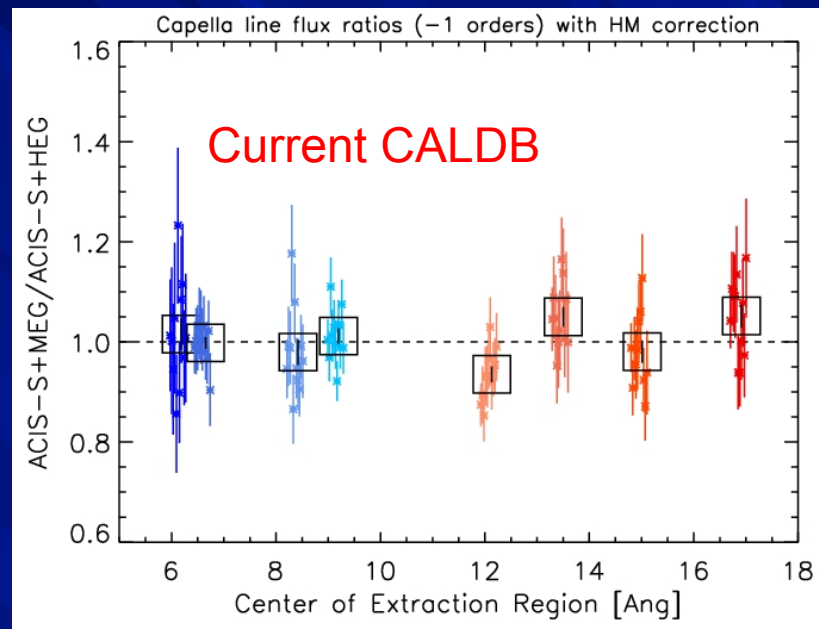
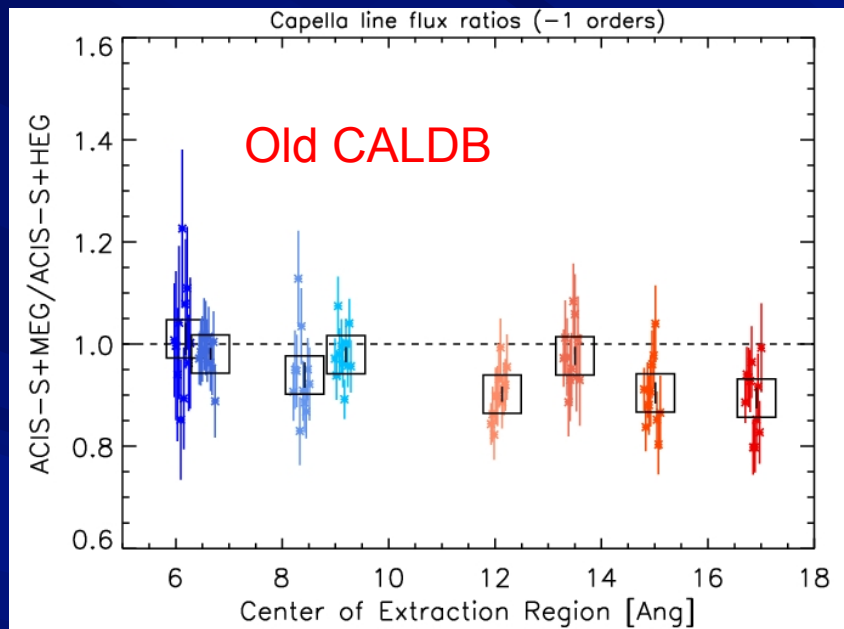
Gratings Efficiency Calibration - HETG

Sample of about 30 HETG/ACIS-S AGN observations



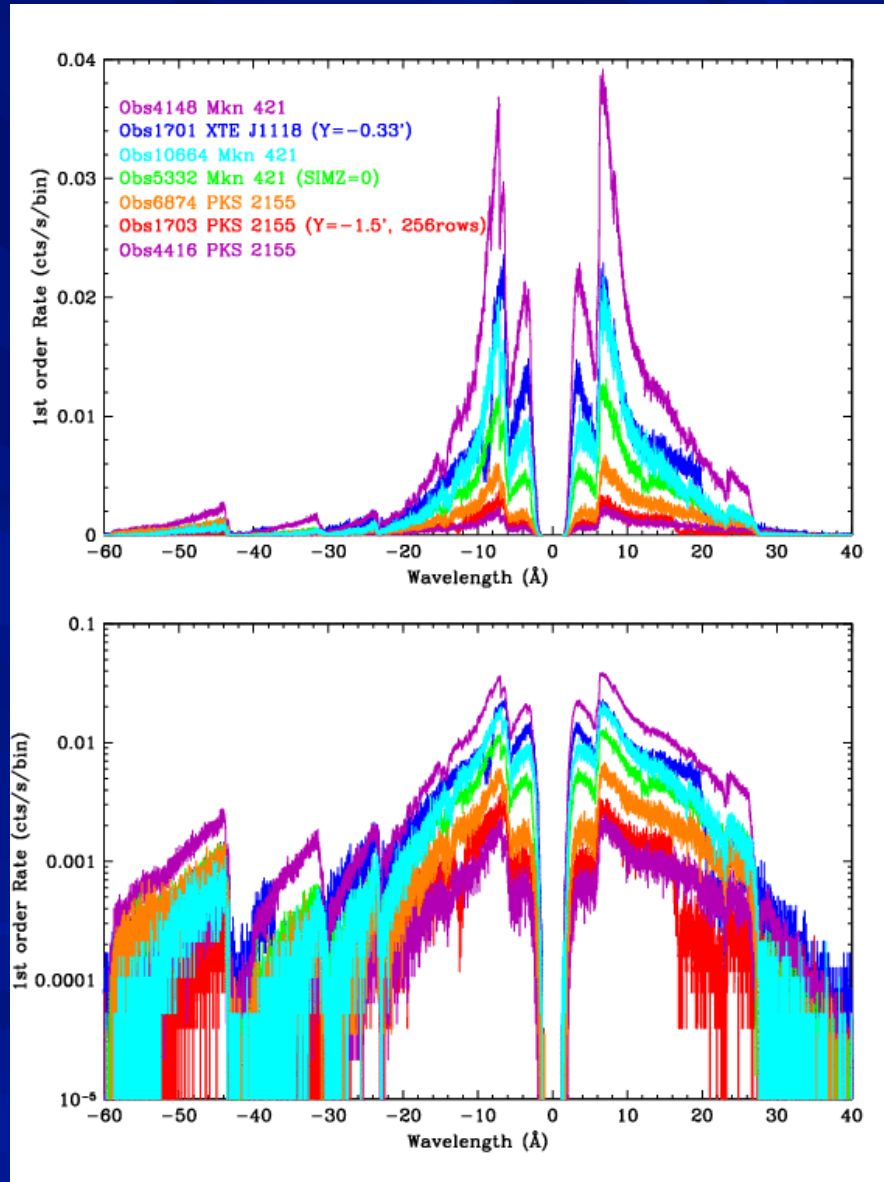
ACIS Cal Group 7/15/11

HEG/MEG First Order Transmission Efficiency (Capella)

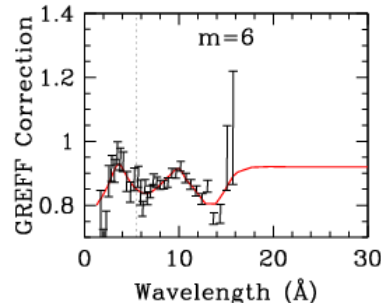
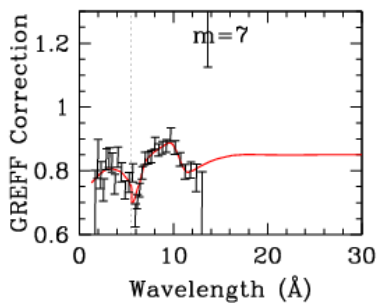
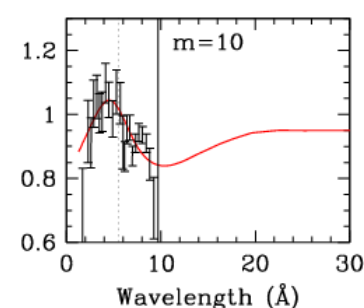
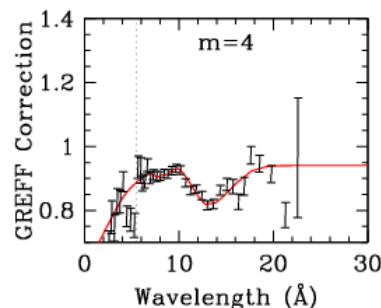
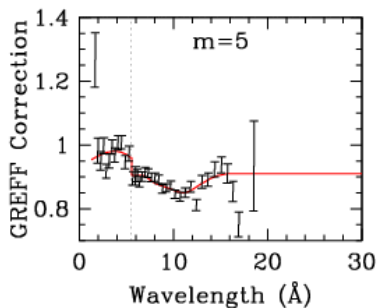
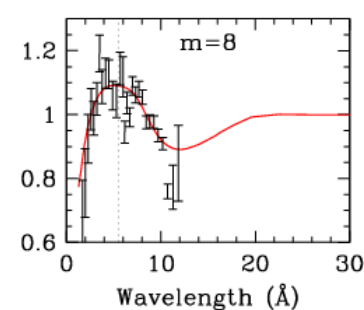
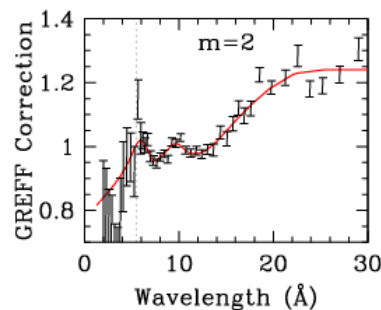
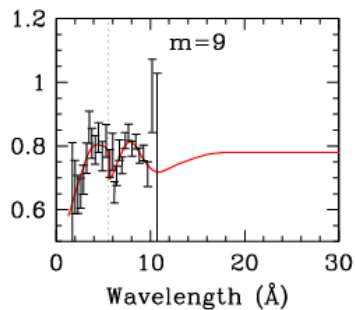
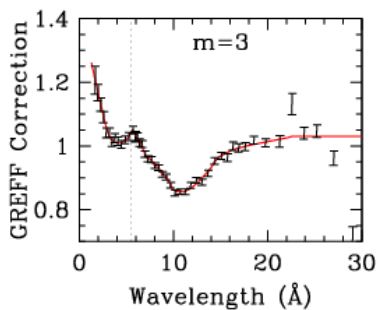


Gratings Efficiency Calibration - LETG

Higher
Orders
($m=2-10$)

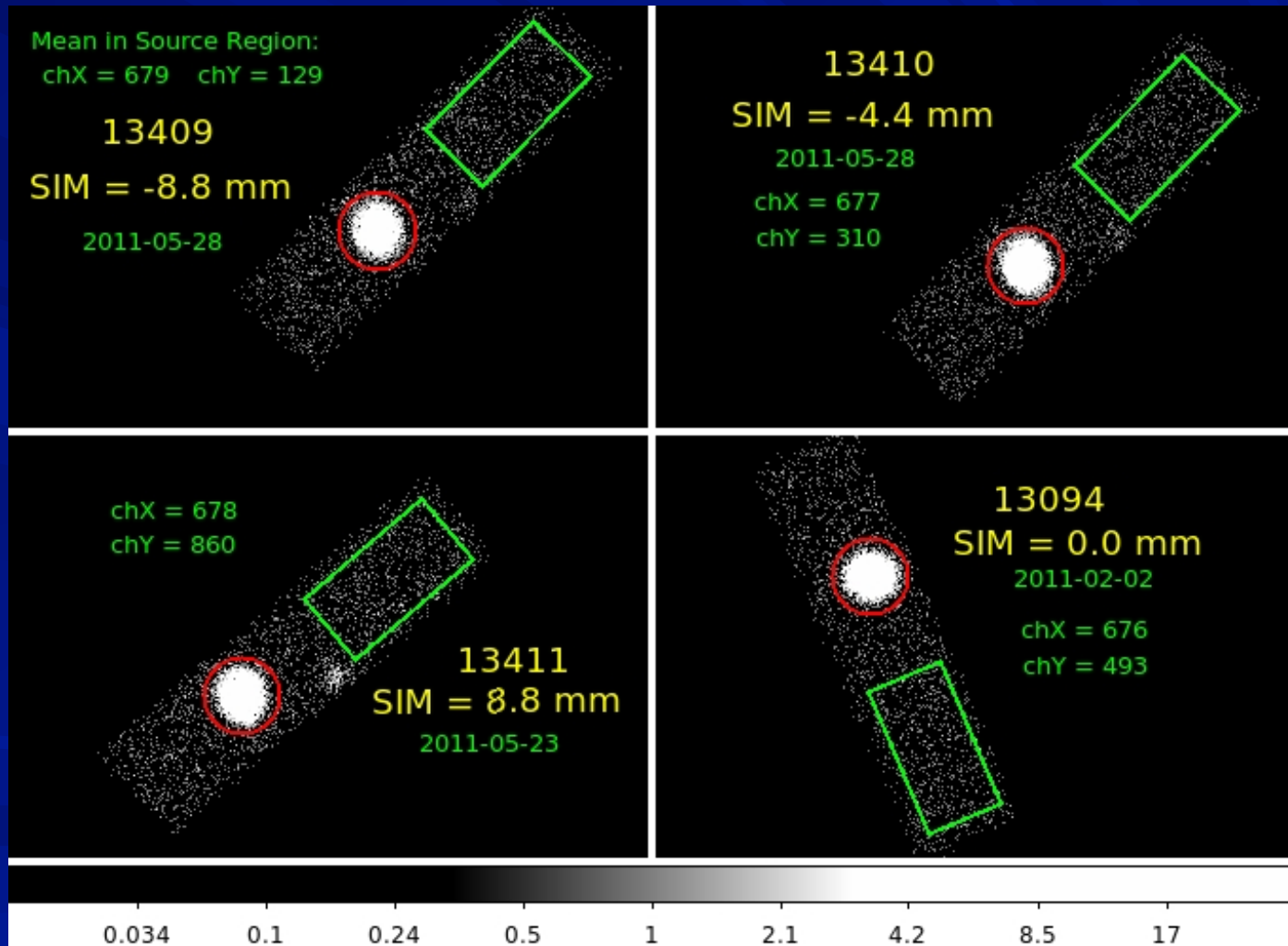


Updates to the LETG Higher Order Efficiencies



Gain Calibration Issues – ACIS-S1

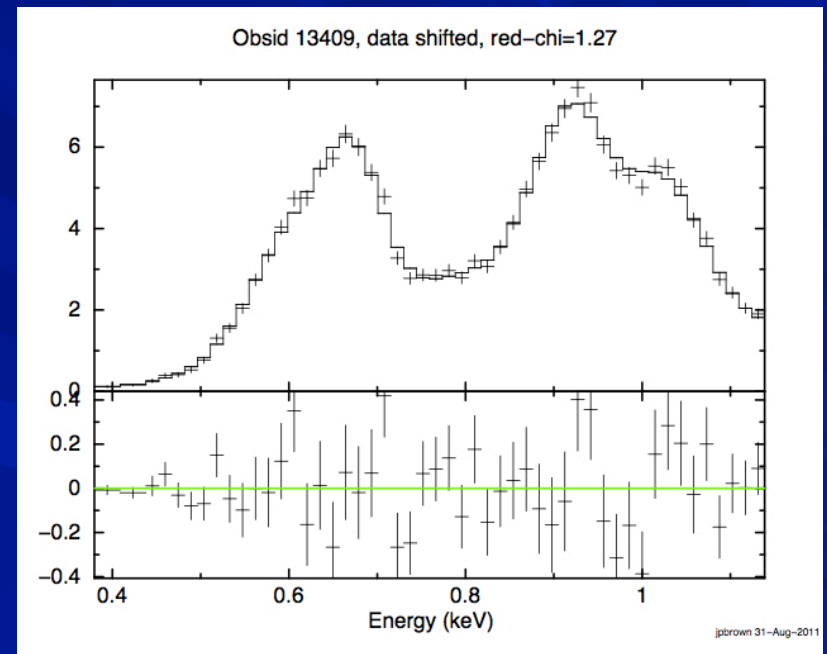
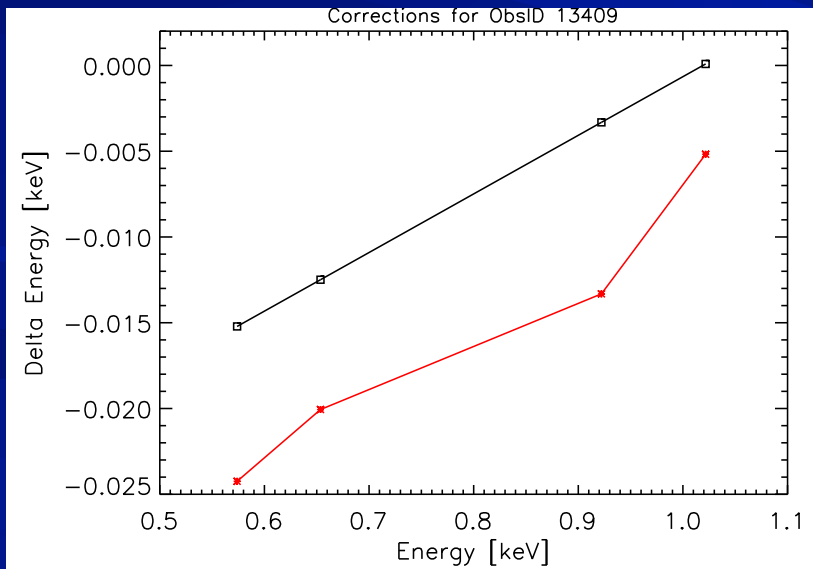
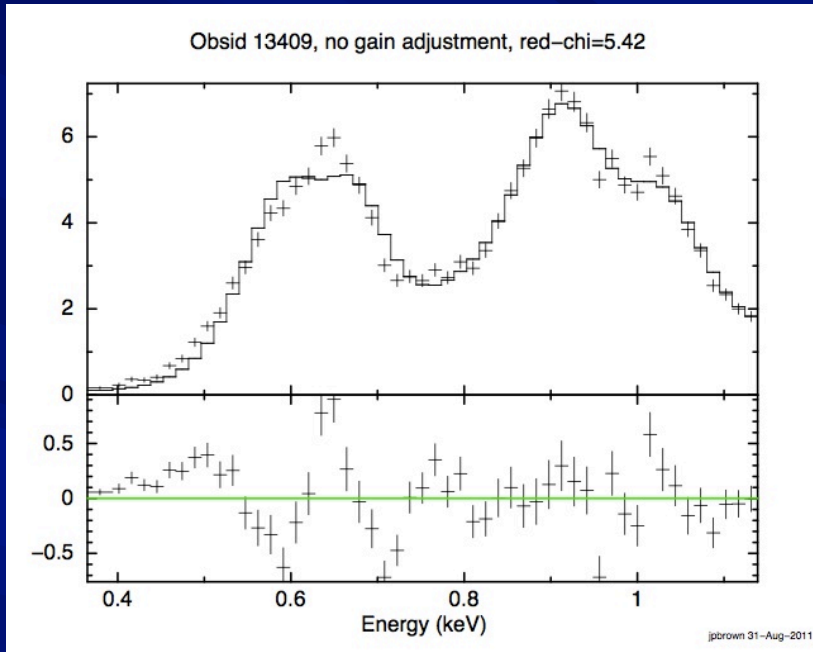
E0102-72 observations on S1 node 2



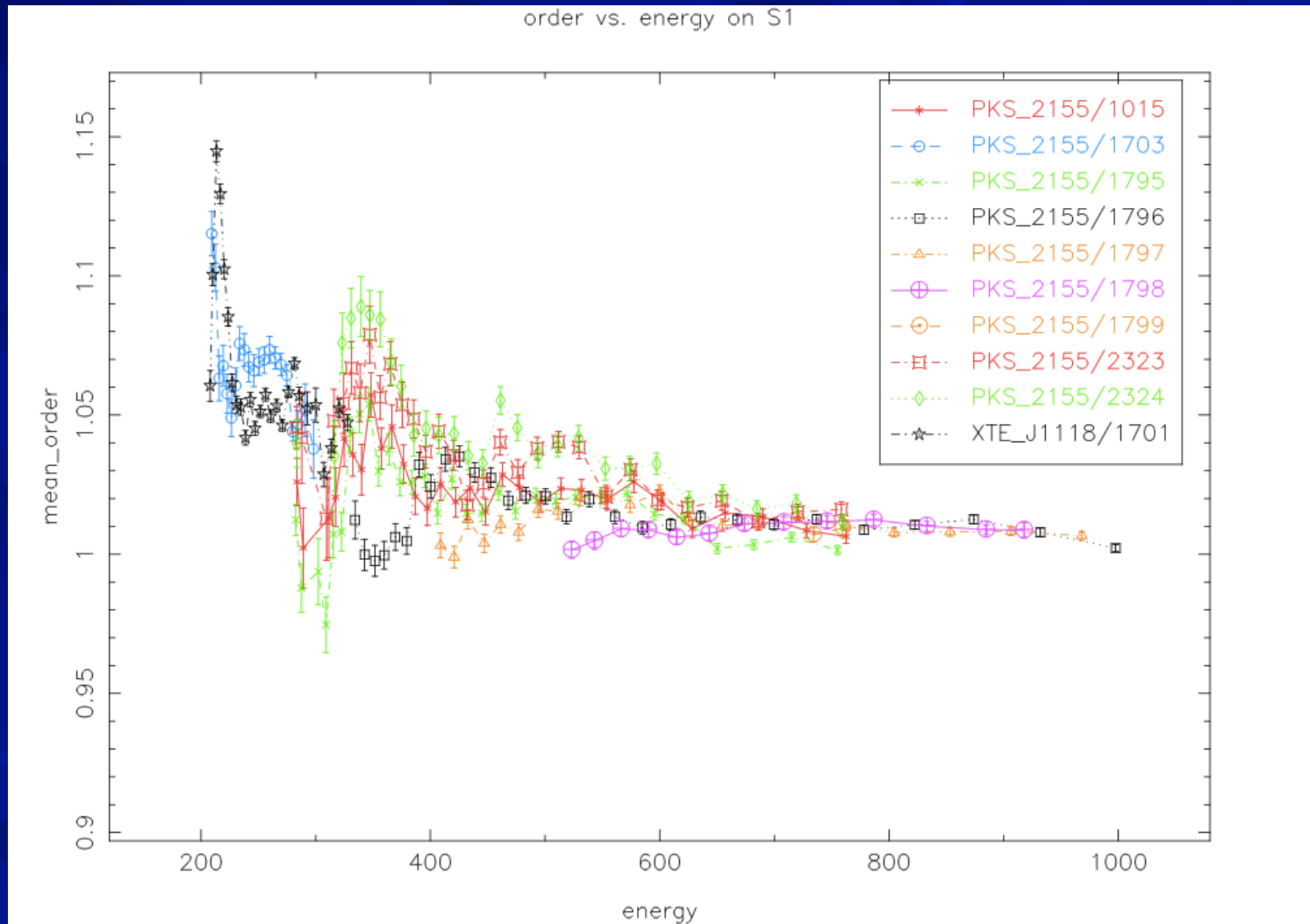
Gain Calibration – ACIS-S1

E0102-72

Near default LETG/ACIS-S configuration

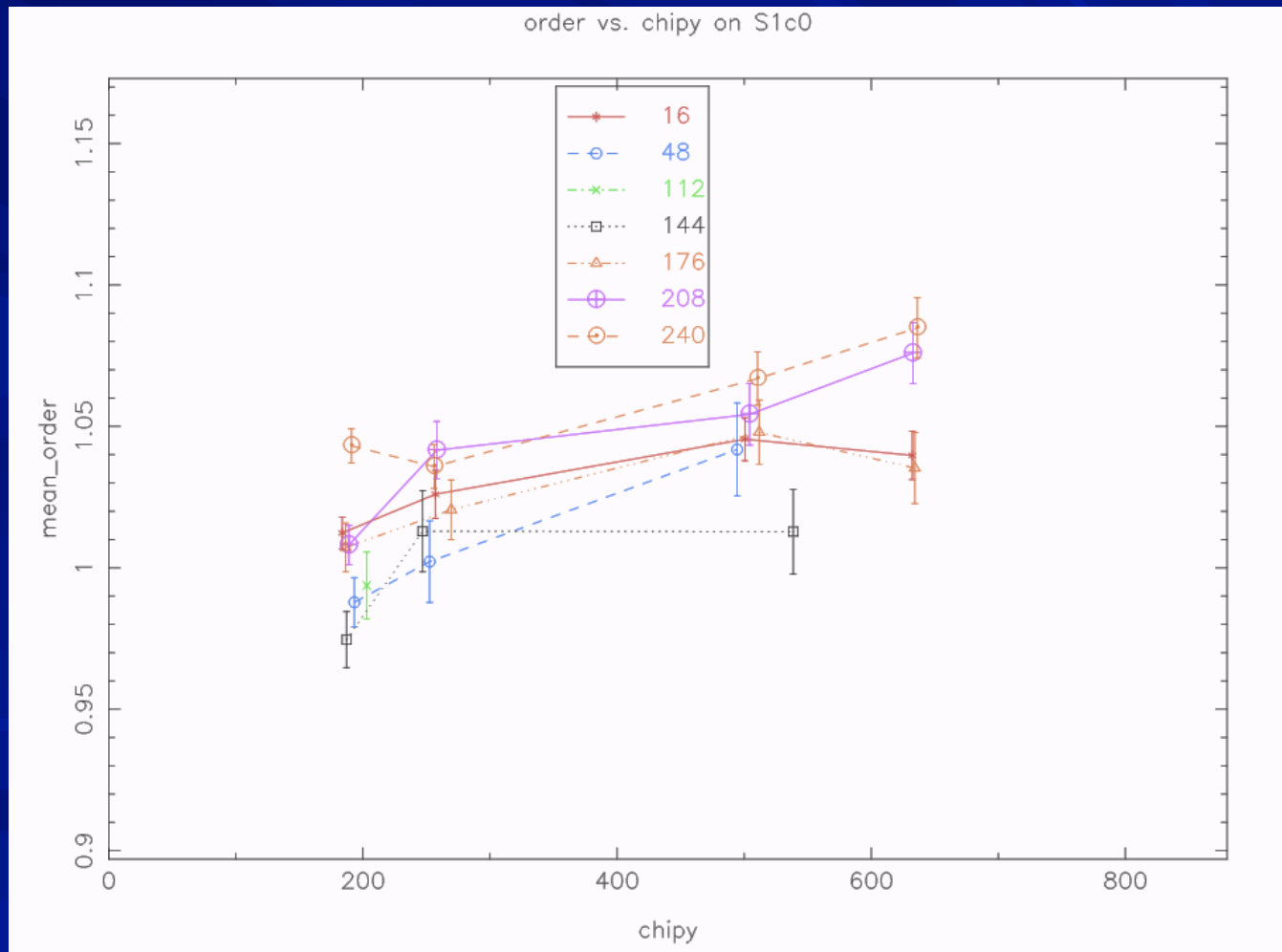


Gain Calibration – ACIS-S1

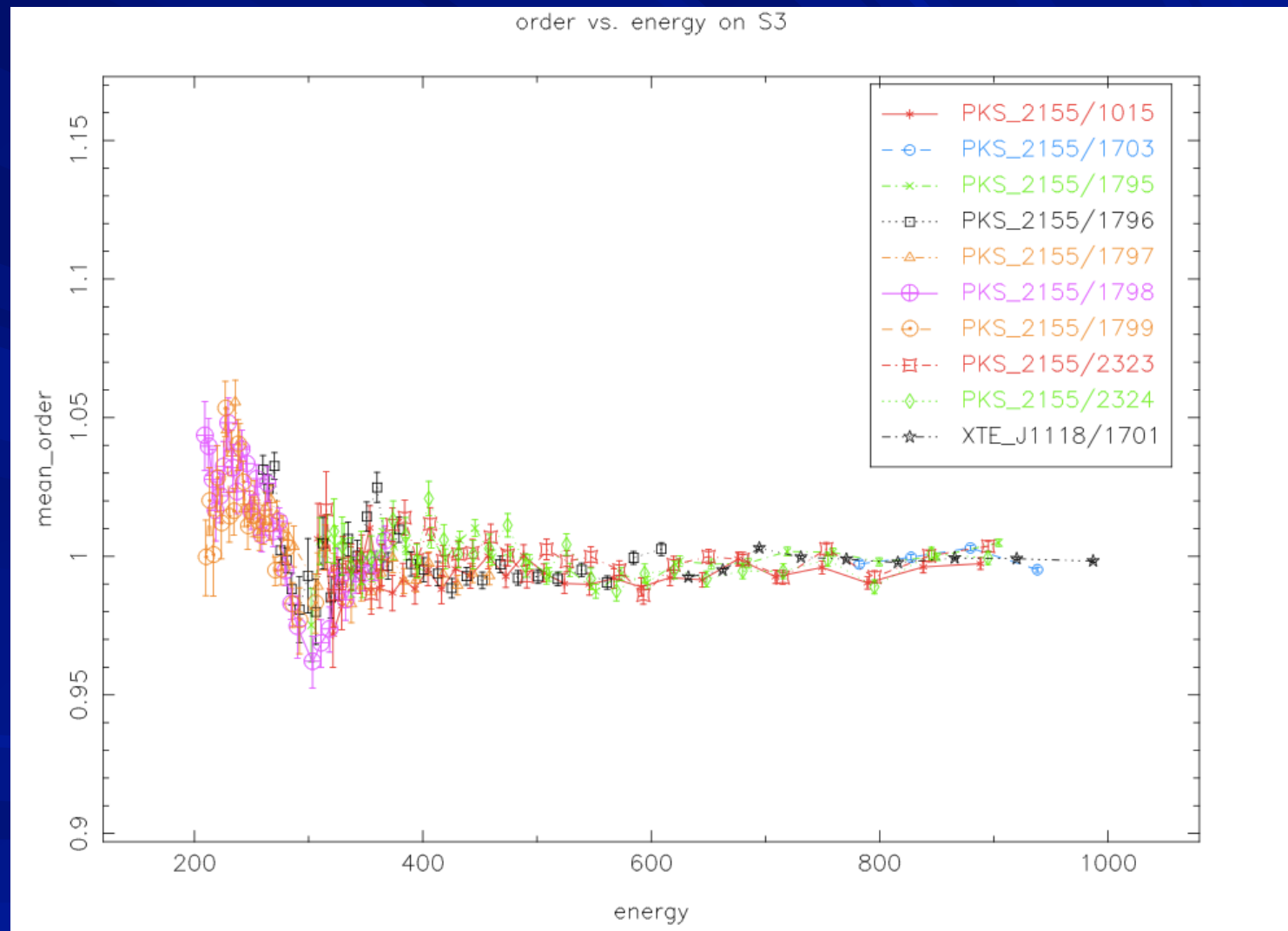


Gain Calibration – ACIS-S1

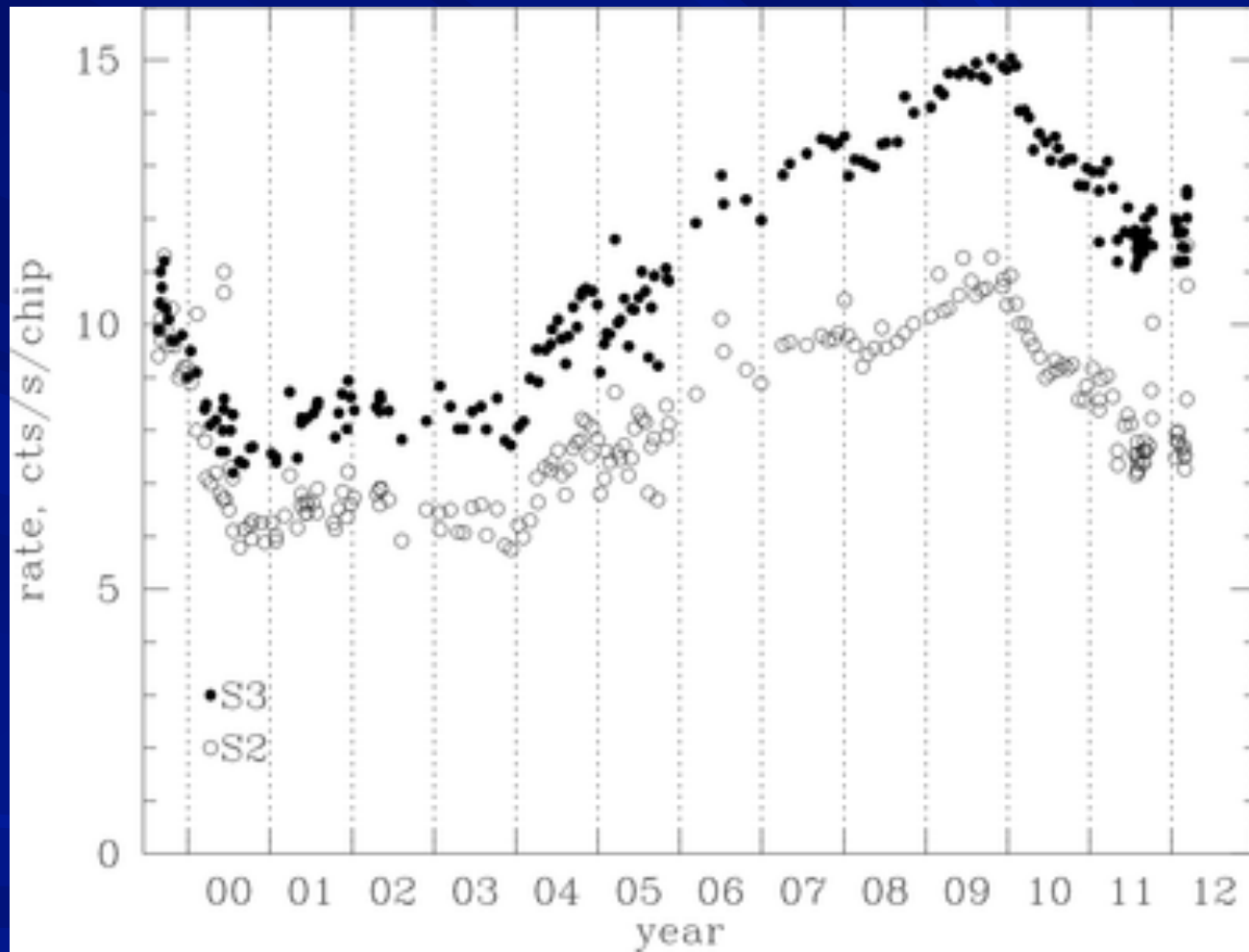
Gain correction vs. chipy



Gain Calibration – ACIS-S3

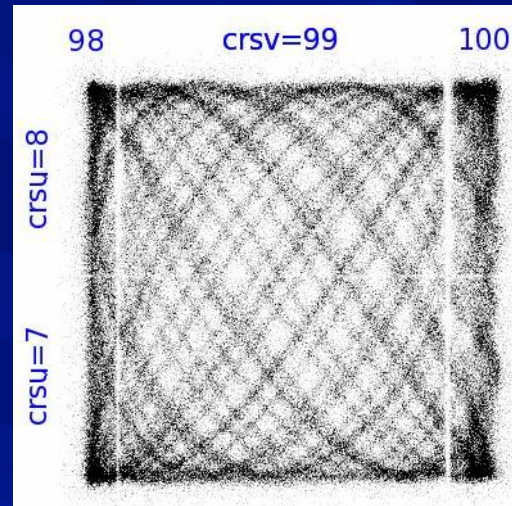


ACIS Background

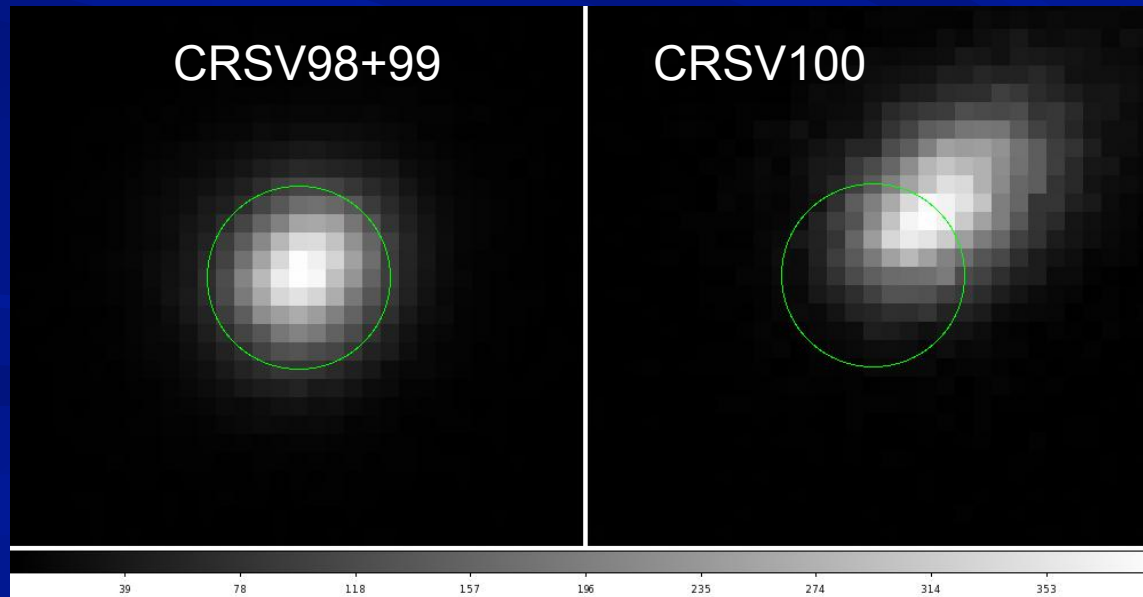


Current Imaging (astrometry) Issues – HRC-S

Recent distortion In LETG/HRC-S 0th order image

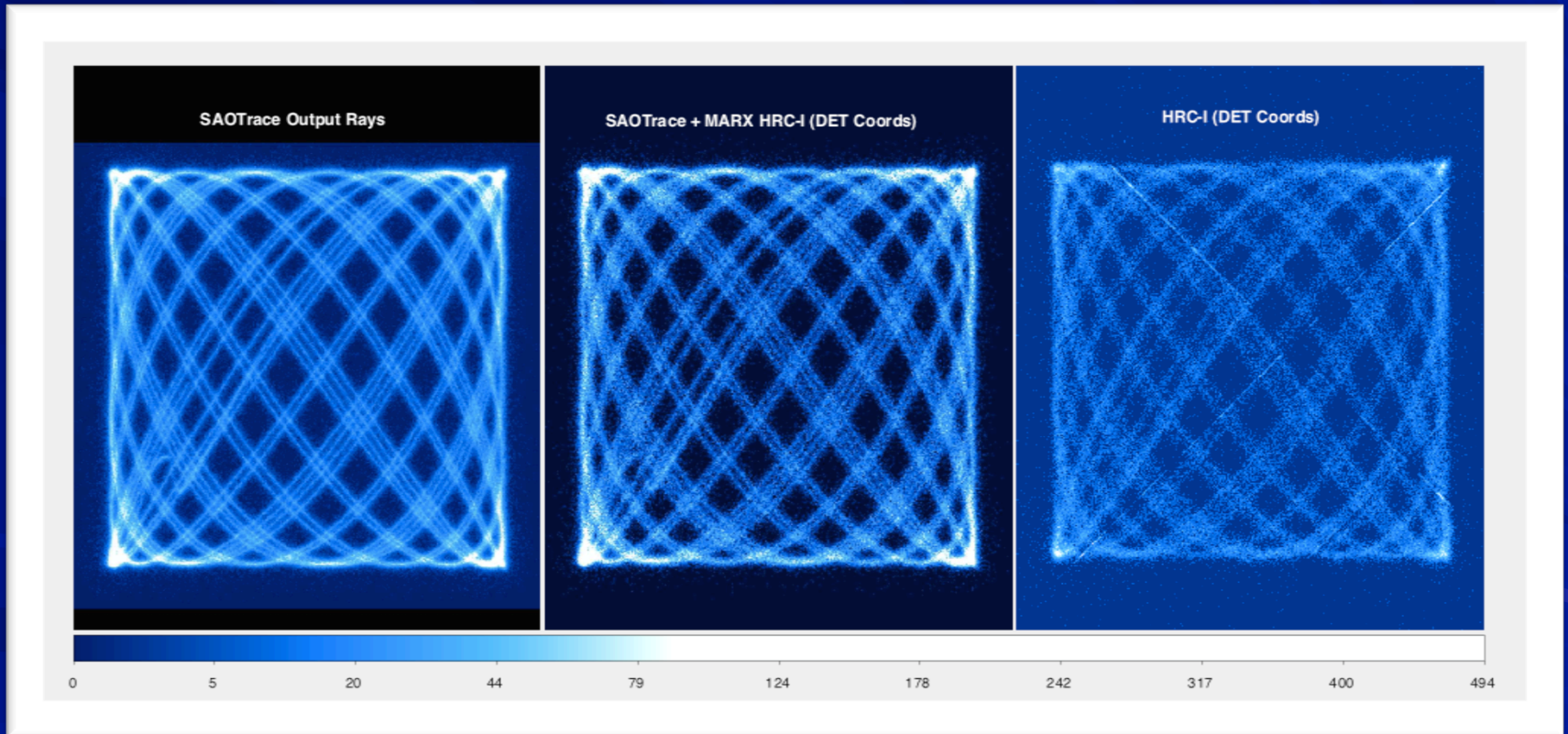


0.625" radius
circle



New SAOTrace Features - Dither

Dithered SAOTrace simulation of an HRC-I observation of AR Lac

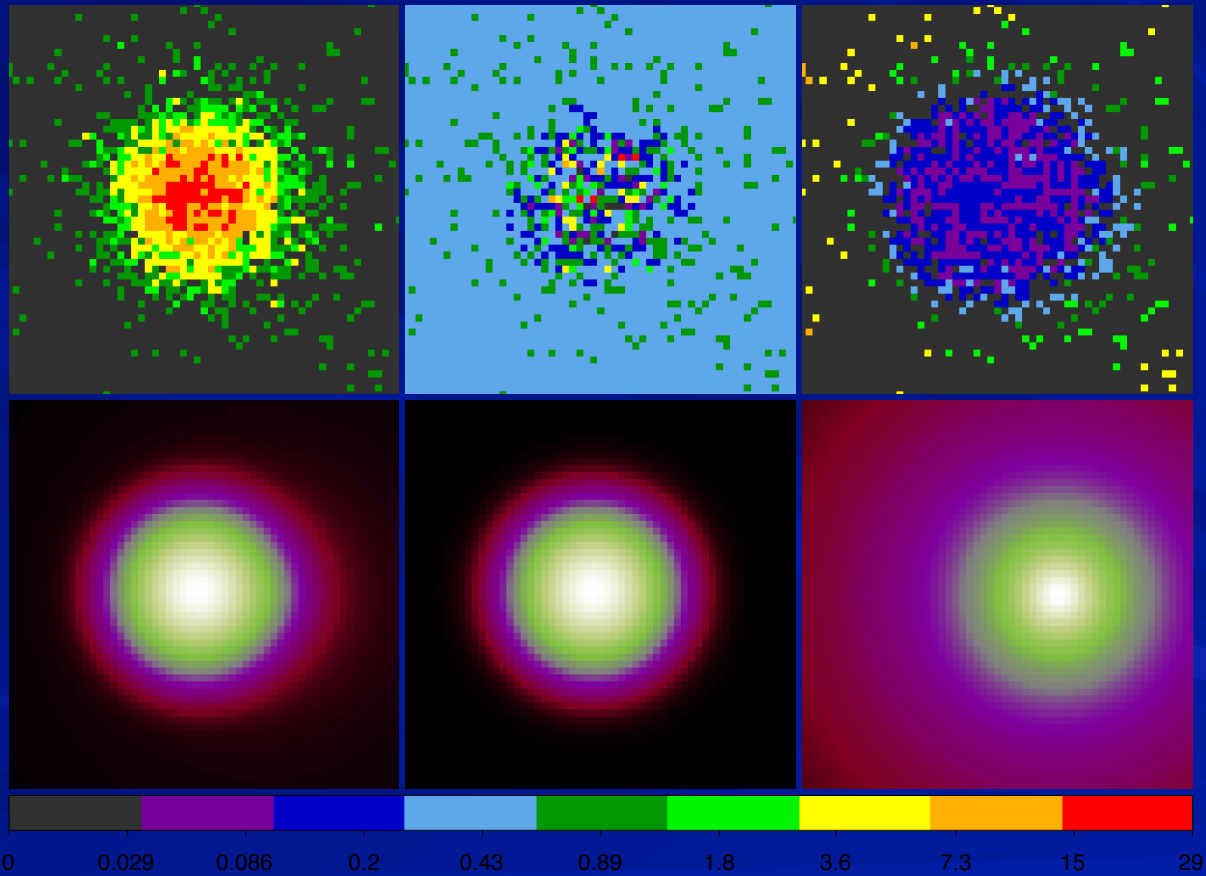


HRC-I Intrinsic Response

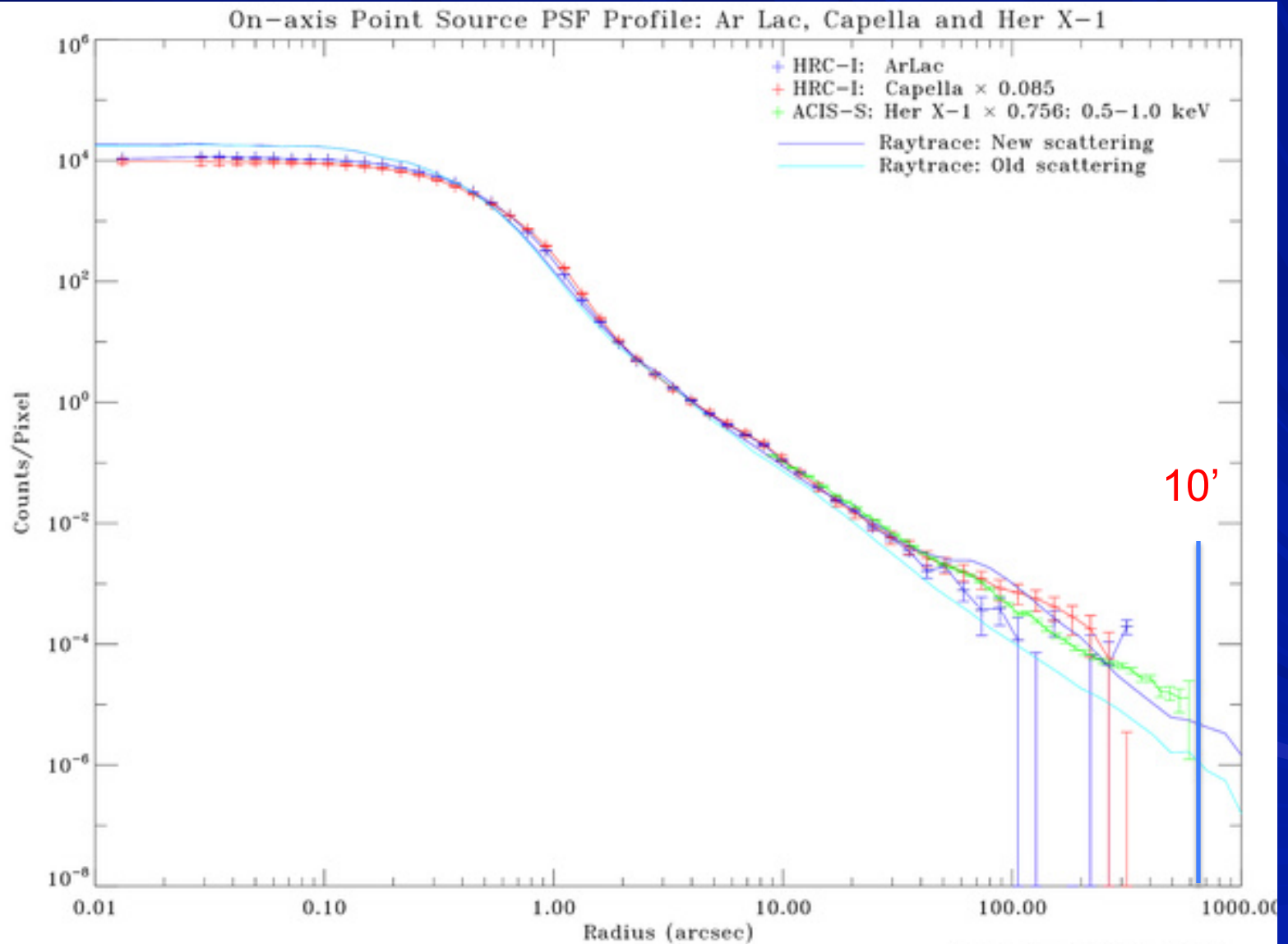
Raw

Gaussian

Gaussian plus Lorentzian



SAOTrace New Features – New Scattering Model



Summary of Present Calibration Activities

- Update ACIS contamination model
- Revise S1 (and possibly S3) gain at low energies
- Generate a set of time-dependent QE maps for ACIS
- Continue investigation into the ACIS feature near the Si-K edge
- Continue testing ACIS CC-F mode calibration products and script
- Calibrate HRC-S at new operating voltage
- Repeat internal cross-calibration studies
- Release new HRC-S de-gap map
- Modify SAOTrace to reproduce the observed PSF/wings

ACIS Feature near the Si-K edge in bright sources

Cyg X-2

